

TRACHYSPHYRUS AND THE NEW GENUS *AELIOPOTES*
IN THE COASTAL DESERT OF PERÚ AND NORTH CHILE
(HYMENOPTERA: ICHNEUMONIDAE).

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INTRODUCTION

The Study Area

As here considered, the Coastal Desert includes the Peruvian and north Chilean littoral zone and contiguous west Andean slopes between about 5° and 23° South Latitude. Eastward it is bounded by 4–6000 m high Andean peaks, which impose both a rain shadow and a thermic barrier. Westward, the Pacific Ocean with its cold Humboldt Current, creates another rain trap and further exacerbates Coastal Desert aridity. Northward, in Ecuador where the Humboldt Current turns out to sea, the Desert yields abruptly to Thorn Scrub and Tropical Humid Forest. On the far south, below Iquique, Chile, the Andean and Humboldt Current rain shadows intensify and determine a 1000 km stretch of wasteland, which reaches up to 3000 m and is practically unrelieved by rivers.

Consequently, there is little contemporary biotic peregrination between the Coastal Desert and more humid tropical communities on the north or with the Mediterranean Scrub of central Chile on the south. Some high-Andean animals and plants extend across the Peruvian and Bolivian highlands onto the upper west Andean slopes of Perú and Chile, but the Andes are so huge at these latitudes that such interchange is limited to relatively few cold-tolerant species. For this reason, the Coastal Desert possesses many endemic species of flora (Solbrig 1976: 34) and fauna (Porter 1983: 523–47), and plausibly may be recognized as a strongly defined biotic subprovince of the Neotropic Realm.

The mesostenine ichneumonid genus *Trachysphyrus* and its Coastal Desert offshoot, *Aeliopotes*, conform well to the foregoing

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biogeographic pattern. Eight species (*A. paitensis*, *T. metallicus*, *T. carrascoi*, *T. agalma*, *T. aegla*, *T. aglaus*, *T. imperator*, and *T. escomeli*) have not been collected outside the zone and probably constitute endemics. Three additional species are known from the Desert. *Trachysphyrus cleonis* is a high-Andean element that ranges at least as far inland as Cuzco, Perú; *T. venustus* extends widely over the Altiplano and Puna in Perú, adjacent Chile, Bolivia, and northwest Argentina. In contrast, *T. viridis* ranges from southern Perú to Patagonian Argentina, with a preference for Subandean Desert and Chaco habitats. Solbrig (1976: 34-5), notes that many Coastal Desert plants, like the ichneumonid *Trachysphyrus viridis*, show Chaco and Subandean affinities (e.g., *Geoffroea decorticans*, *Prosopis chilensis*, *Acacia caven*, *Bulnesia retama*, and *Larrea divaricata*). Such disjunct geographic patterns probably demonstrate that the Argentine Chaco and the Peruvian-Chilean Coastal Desert were not always so rigorously separated, physically and climatically, as has been the case during the Pleistocene and much of the later Tertiary.

Taxonomy and Relationships

Trachysphyrus and *Aeliopotes* are confined to subequatorial South America. The latter is a Coastal Desert endemic. The former has approximately 20 species distributed from Ecuador to Tierra del Fuego in Andean, subtropical, temperate, and Neantarctic habitats. Of these 20, at least 10 are confined (in Perú, Bolivia, north Chile, and northwest Argentina) to the Andean Puna and Altiplano between 2800 m and more than 4000 m, and 7 of these seem restricted to the western Puna.

The *Trachysphyrus-Aeliopotes* complex includes large mesostenines with uniformly dark wings; no white markings on the mesosoma; a metallic (blue, green, purple, etc.) or black and red ground color; the notauli strong and usually more than half the length of the mesoscutum; the mesoscutal surface punctured but shining; the discocubitus gently arched to a little angled; the mediella straight; the axillus located halfway between the anal margin of the hind wing and the submediella; the propodeal spiracle elongate; the 2nd gastric tergite polished or mat but never strongly punctured; and the ovipositor strong, elongate, moderately compressed, straight to a little upcurved and with a distinct nodus. Other features diagnostic for

this group, include the unmodified female flagellum; presence of tyloids on the male flagellum; relatively low (convex to subpyramidal) clypeal profile; usually unmodified apical margin of clypeus; epomia strong in scrobe; stout but never inflated female fore tibia; sharp externo-ventral basal groove on hind coxa; large areolet with intercubiti parallel to moderately convergent above; strongly expanded female postpetiole; and well developed ventro-lateral carina of 1st gastric tergite.

Aeliopotes is a low-altitude (0–2800 m) Coastal Desert relative of *Trachysphyrus*. Its chief distinguishing characters reside in its black and red (not metallic) ground color; dorsally produced and lamellately modified epomia; strong triangular projection laterally at base of petiole (vestigial in small males); and complete lack of a notch at the summit of the nodus on the dorsal valve of the ovipositor tip.

My present concept of *Trachysphyrus* differs from that of other recent authors (Townes 1969, Porter 1967) in that it restricts the genus to those South American species closely allied to the genotype, *T. imperialis* Haliday. I consider both *Trachysphyrus* and *Aeliopotes* to be phyletically proximate to the Sonoran, Floridian, Cuban, and disjunctly South American genus *Compsocryptus*. *Compsocryptus* particularly resembles *Aeliopotes* in having an expansion at the base of the postpetiole (weak to obsolete in all males). It also has a sympatric Coastal Desert species, *C. fuscofasciatus* (Brullé). *Compsocryptus* easily may be differentiated from related genera by the contrastingly yellow and dark banded fore wing, mat mesoscutum with weak and short notaulus (less than half the mesoscutum), and definitely upcurved ovipositor.

Ecology and Hosts

Information about habit preferences of many species is summarized under the discussion of each taxon.

The only rearing data for this generic group correspond to *T. viridis* (Brullé), which has been associated in Argentina with the saturniid moths *Catocephala lauta* and *Automeris cresus* (Porter 1967: 309). According to Forbes (192: 670), species of *Automeris* construct their cocoons “between leaves on the ground”. This habit renders *Automeris* a plausible host for *T. viridis* and other *Trachysphyrus*, whose females most often are found flying just above or crawling among low vegetation and ground litter.

COLLECTIONS EXAMINED

Listed below in alphabetic order are collections which furnished material for this study and/or in which type and voucher specimens are or are to be deposited. I refer to institutional collections by the name of the city where they are located and to individual collections by the surname of the owner. Specimens of *Aeliopotes paitensis*, *Trachysphyrus carrascoi*, and *T. metallicus* will be distributed to Arica, Cambridge, College Station, Gainesville, Lawrence, Porter, Townes, and Washington.

ARICA. Centro de Investigación y Capacitación Agrícola, Departamento de Agricultura, Universidad de Tarapacá, Arica, Chile.

BUENOS AIRES. Museo Nacional de Ciencias Naturales. Avenida Ángel Gallardo 470, Buenos Aires, Argentina.

CAMBRIDGE. Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138.

COLLEGE STATION. Department of Entomology, Texas A & M University, College Station, TX 77843.

GAINESVILLE. Florida State Collection of Arthropods, Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, P.O. Box 1269, 1911 SW 34th Street, Gainesville, FL 32602.

LAWRENCE. Department of Entomology, Snow Entomological Museum, The University of Kansas, Lawrence, KS 66045.

LONDON. Department of Entomology, British Museum (Natural History), London, SW 7 5 BD, England.

PORTER. Collection of Charles C. Porter, 301 North 39th Street, McAllen, TX 78501.

TOWNES. American Entomological Institute, c/o Dr. Virendra Gupta, Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, P.O. Box 1269, Gainesville, FL 32602.

TURIN. Museo ed Istituto di Zoologia Sistemática, Via Giolitti 34, Turin, Italy.

WASHINGTON. Department of Entomology, U.S. National Museum, NHB 168, Washington, DC 20560.

Genus **AELIOPOTES** Porter, new genus

Type species: *Amblyteles paitensis* Cockerell.

Fore wing 6.9–12.5 mm long. Coloration black with red gaster, partly red legs, white on flagellum, and wings blackish with metallic reflections. Flagellum moderately long and slender, scarcely flattened below apicad in female, in male with delicate and linear tyloids developed on some segments, its 1st segment 4.6–4.9 as long as deep at apex in females and 3.0–3.7 as long as deep in males. Clypeus weakly to very weakly, more or less symmetrically convex in profile, its apical margin slightly convex. Occipital carina sharp and narrow, joining the moderately elevated hypostomal carina below. Malar space 0.8–1.0 as long as basal width of mandible. Pronotum: submarginal groove broad and usually rather shallow; epomia strong in scrobe and developed above into a broad and sharply differentiated, bluntly triangular or obtuse plate-like structure. Mesoscutum: notauli fine and narrow, reaching 0.7–0.8 the length of mesoscutum; surface shining with uniformly dense moderately small, sharp, adjacent to subadjacent punctures. Mesopleuron with the swollen speculum mostly smooth and shining; surface opposite speculum above along prepectal carina with a shining callos that may be finely and densely punctate or which sometimes is punctured and longitudinally striate throughout or only peripherally invaded by longitudinal wrinkles and whose surface on upper half beyond callous is radiately wrinkled and on lower half is quite uniformly and coarsely puncto-reticulate and wrinkled. Fore tibia stout but not inflated. Hind coxa with a sharp and strong subvertical groove externo-ventrally near base. Wing venation: areolet large, intercubiti rather weakly to strongly convergent above; 2nd abscissa of radius 0.6–0.8 as long as 1st intercubitus; 2nd recurrent a little reclivous, weakly and evenly curved or sometimes comparatively more strongly curved on upper half; discocubitus gently arched, without a ramellus; mediella straight beyond base; axillus far from anal margin of wing, intermediate between anal margin and submediella. Propodeum: spiracle elongate, 2.0–2.5 as long as wide; profile varying from moderately short and high (female) to rather low and elongate (male); basal trans-carina finely traceable throughout or often weak and irregular toward middle; apical trans-carina

occasionally fine but sharp throughout, more often faint and irregular to almost absent; basal area usually distinct; median longitudinal carinae sometimes faintly demarking a hexagonal areola; cristae broadly low-cuneate to short subligulate. First gastric tergite: with a strong, bluntly triangular lateral expansion at base of petiole (weak only in dwarf males); postpetiole in female 1.4–1.7 as wide apically as long from spiracle to apex, in male 0.8–1.4 as wide; ventro-lateral carina strong on petiole, variably developed on postpetiole; dorso-lateral carina weak, most distinct toward apex of petiole and on base of postpetiole; dorsal carinae in female visible but not sharp for some distance on petiole and on about basal half of postpetiole, where they define a weak median elevation, absent in male. Second gastric tergite in female smooth and shining to a little dull, with vague to fine but strong micro-reticulation and sparse, medium sized, shallow punctures that emit short, well separated setae and in male similar but with abundant, well separated, rather small and superficial punctures that emit long, considerably overlapping setae. Ovipositor 0.60–0.70 as long as fore wing; straight or slightly upcurved; moderately stout, somewhat compressed; nodus low but distinct and without a notch; tip 0.13–0.18 as high at nodus as long from nodus to apex; ventral valve on tip with fine, well spaced, inclivously oblique ridges.

GENERIC NAME. From the Greek nouns *aëlius*, “sun” and *potes*, “drinker”.

1. *Aeliopotes paitensis* (Cockerell)
(Figs. 17, 19–22)

Amblyteles paitensis Cockerell, 1927. Entomologist **60**: 158. Type ♂: Perú, Paita (Washington).

Trachysphyrus paitensis Townes, 1966. Mem. Amer. Ent. Inst. **8**: 72.

Aeliopotes paitensis was redescribed (Porter 1967: 272–75) from 3 females and 6 males (including the holotype) collected throughout most of the Peruvian Coastal Desert between Paita near the Ecuadorian border on the north to Arequipa in the far south. More recent fieldwork has added 2 females and 19 males from much of the same region. This material permits some modification of my original diagnosis.

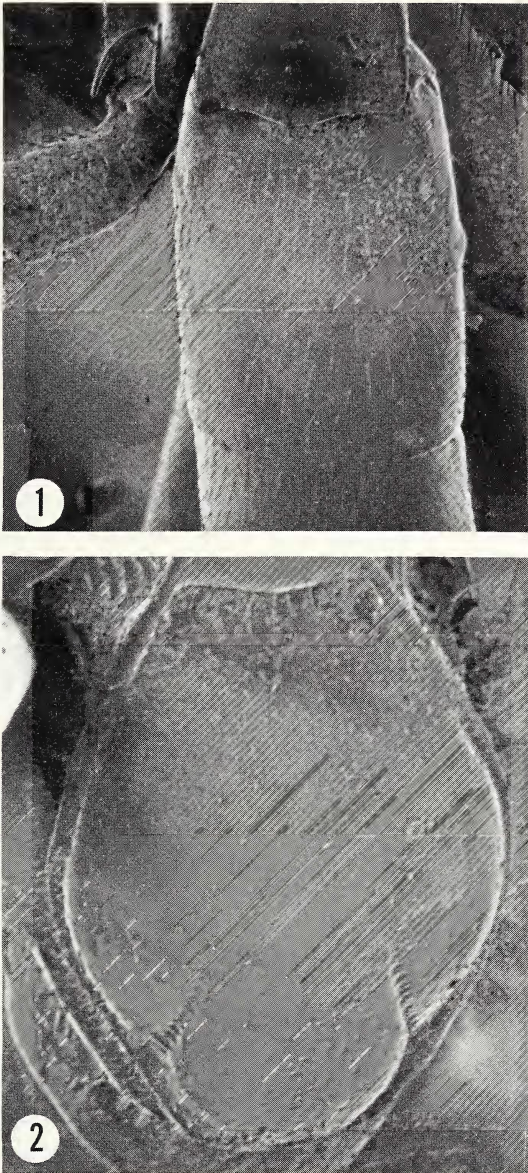


Fig. 1. *Trachysphyrus aegla*, ♂. Paratype. SEM photograph (25 \times), showing setation of 2nd gastric tergite. Fig. 2. *Trachysphyrus aegla*, ♂. Paratype. SEM photograph (60 \times), showing mesoscutum with short notauli and sparse punctation.

FEMALE. *Color*: sometimes with a little white at base of 1st flagellomere; white flagellar band sometimes reaching onto 10th flagellomere; fore and mid legs sometimes with only very faint blackish staining, except on fore coxa; gaster sometimes with considerable black staining.

Length of fore wing: 8.5–12.5 mm. *First flagellomere*: 4.6–4.9 as long as deep at apex. *Malar space*: 0.8–1.0 as long as basal width of mandible. *Temple*: 0.3–0.5 as long as eye in dorsal view. *Mesoscutum*: notauli reaching 0.7–0.8 the length of mesoscutum. *Mesopleuron*: swollen area along prepectal carina above opposite speculum sometimes punctured and longitudinally striate throughout. *Wing venation*: radial cell 3.5–4.0 as long as wide. *Propodeum*: spiracle 2.0–2.5 as long as wide; cristae broadly low-cuneate to short subligulate; apical trans-carina occasionally fine but sharp throughout. *First gastric tergite*: postpetiole 1.4–1.7 as wide apically as long from spiracle to apex; ventro-lateral carina often sharp throughout on postpetiole as well as on petiole. *Second gastric tergite*: occasionally rather dull because of unusually well developed but fine microreticulation. *Ovipositor*: sheathed portion 0.6–0.7 as long as fore wing; tip 0.13–0.18 as high at nodus as long from summit of nodus to apex.

MALE. *Color*: gaster sometimes with extensive and conspicuous black staining; wings in small specimens but weakly fuscous and with only faint metallic reflections.

Length of fore wing: 6.9–12.5 mm. *Flagellum*: tyloids all fine and linear; 1st flagellomere 3.0–3.7 as long as deep at apex. *Malar space*: 0.8–0.9 as long as basal width of mandible. *Temple*: 0.6–0.8 as long as eye in dorsal view. *First gastric tergite*: 0.8–1.4 as wide apically as long from spiracle to apex; small males have the baso-lateral expansion only weakly developed, in large males it is as strong as in females.

NEW SPECIMENS EXAMINED. 2♀ and 19♂: PERÚ, Lima Province, Cupiche, 26-VI-1976, C. Porter, C. Calmbacher; La Libertad Province, Samne, 40 km NE Trujillo, ca. 1500 m, 12–17-VII-1975, C. Porter, L. Stange.

VARIATION. *Aeliopotes paitensis* seems widely and perhaps disjunctly endemic to the Coastal Desert at altitudes from 0 to 2800 m. Nonetheless, the variation outlined above appears strictly individual. In spite of this insect's extensive range, it shows no phenotypically discrete local populations.

FIELD NOTES. My specimens of *A. paitensis* were collected in flight, usually not far off the ground in grassy areas near water. I have not taken the species on *Baccharis*.

Genus *TRACHYSPHYRUS*

Trachysphyrus Haliday, 1836. Trans. Linnean Soc. London 17: 317. Type: *Trachysphyrus imperialis* Haliday.

Cyanocryptus Cameron, 1903. Entomologist 36: 121. Type: *Cyanocryptus metallicus* Cameron.

Lamprocryptus Cameron, 1910. Trans. Amer. Ent. Soc. 35: 435. Name preoccupied by Schmiedeknecht, 1904. Type: (*Cryptus kinbergi* Holmgren) = *viridis* (Brullé)

Mesocryptus Szépligeti, 1916. Ann. Mus. Natl. Hungarici 14: 251. Name preoccupied by Thomson, 1873. Type: *Mesocryptus pulcherrimus* Szépligeti) = *venustus* Myers

Pseudomesocryptus Strand, 1917. Internatl. Ent. Ztschr. 10: 137. New name for *Mesocryptus*.

Fore wing 6.0–16.0 mm long. Coloration metallic green, blue, purple, golden or often varicolored metallic; no pale markings on mesosoma and in only 1 species with white on gaster; wings brownish to black, with a metallic lustre, never contrastingly light and dark banded. Flagellum moderately long and slender, scarcely flattened below toward apex in female, in male with tyloids well developed on some segments and varying from linear to elliptic or ovoid, its 1st segment 3.5–5.5 as long as deep at apex in females and 2.2–3.7 as long as deep in males. Clypeus: in profile almost flat to moderately high convex or, rarely, subpyramidal; its apical margin straight to rather strongly convex, edentate, occasionally a little produced and feebly bilobed on meson. Occipital carina: sharp but not strongly raised; joining the sharp but not much raised hypostomal carina below. Malar space 0.70–1.8 as long as basal width of mandible. Pronotum: submarginal groove broad and variably strong; epomia usually sharp in scrobe but never strongly turned mesad or produced into a plate-like structure above. Mesoscutum: notauli usually strong, extending 0.3–0.9 the length of mesoscutum; surface mostly smooth and shining, sparsely to densely but not grossly punctate, never strongly wrinkled or extensively mat. Mesopleuron with speculum usually smooth and shining but occasionally more or less puncto-reticulate; surface otherwise wholly or in part finely to grossly and usually reticulately wrinkled; no projection or ridge on prepectus below. Fore tibia never inflated. Hind coxa with a sharp and strong subvertical groove externo-ventrally near base.

Wing venation: areolet large to very large, intercubiti almost parallel to moderately convergent above; 2nd abscissa of radius 0.7-1.2 as long as 1st intercubitus; 2nd recurrent practically straight or gently and evenly curved; discocubitus gently and evenly curved, weakly sinuate, or sometimes a little angled, ramellus absent to sometimes very long; mediella straight beyond base; axillus far from anal margin of hind wing, usually about intermediate between hind margin and submediella. Propodeum: spiracle elongate or very elongate; profile varying from short and high to moderately elongate and sloping rearward (especially in males); basal trans-carina, apical trans-carina, and median and lateral longitudinal carinae sometimes all at least weakly detectable or, often, more or less effaced; cristae varying from low and broad subligulate or subcuneate to very strongly projecting ligulate. First gastric tergite: without a lateral expansion at base of petiole; postpetiole in female 1.1-2.3 as wide apically as long from spiracle to apex, in male 0.7-1.7 as wide; ventro-lateral and dorso-lateral longitudinal carinae usually well developed throughout; dorsal carinae varying from obsolete to at least partly sharp. Second gastric tergite smooth and polished or mat and finely granular; in female with widely scattered, inconspicuous, short setae which may be uniformly much shorter to sometimes in part only a little shorter than their interspaces and in male with long, mostly overlapping setae or with short setae as in female; punctures variably abundant, tiny to moderately large, superficial to sharp, but never large, strong, and extensively subadjacent or adjacent. Ovipositor: 0.50-0.90 as long as fore wing; moderately stout, palpably compressed, straight to gently upcurved; nodus more or less distinct; notch weak to large and deep; tip 0.16-0.24 as high at notch as long from notch to apex; ventral valve on tip with fine, sharp, well spaced, inclivously oblique ridges.

KEY TO THE COASTAL DESERT *TRACHYSPHYRUS*

FEMALES

(Females of *T. aegla*, *T. aglaus*, and *T. imperator* unknown)

1. Head mostly white; gastric tergites 4-7 with broad white apical bands; apical margin of clypeus on median 0.5 gently produced and bilobed 10. *T. venustus* Myers

- 1'. Head at most with narrow white markings; no white on gaster; apical margin of clypeus entire, not or scarcely produced medially2
2. Second gastric tergite uniformly mat and finely granular; notaulus sharp and narrow, reaching 0.8 or more the length of mesoscutum3
- 2'. Second gastric tergite smooth and polished with at most faint micro-reticulation; notaulus 0.3-0.8 as long as mesoscutum, in most species no more than 0.5 as long4
3. Mesoscutum with very abundant, mostly subadjacent to confluent, medium sized to large punctures; flagellum usually with a white band; head and mesosoma purple with blue reflections; gaster mostly blue or blue-green; no golden sheen on thoracic pleura and propodeum9. *T. viridis* (Brullé)
- 3'. Mesoscutal punctures strong and dense only anteriorly on central lobe but elsewhere mostly sparse; flagellum dark; body blue or blue and purple, with golden reflections on thoracic pleura and propodeum 8. *T. cleonis* Viereck
4. Clypeus subpyramidal in profile; notaulus 0.8 the length of mesoscutum; propodeum with moderately strong reticulate wrinkling; flagellum with white on more or less of segments 4-8 7. *T. escomeli* (Brèthes)
- 4'. Clypeus low, gently convex to almost flat in profile; notaulus 0.3-0.5 the length of mesoscutum; propodeum with gross reticulate wrinkling; white on flagellar segments 1, 2 or 3-8, 9, or 105
5. Areolet asymmetric, apical abscissa of cubitus inserted unusually far dorsad; 1st flagellomere 3.2 as long as deep at apex; mesoscutum with numerous but mostly well separated punctures; propodeal cristae broad and strongly projecting subligulate; sheathed portion of ovipositor 0.60 as long as fore wing, no groove extending forward from notch on dorsal valve of ovipositor3. *T. agalma* n. sp.
- 5'. Areolet not asymmetric, apical abscissa of cubitus in normal position; 1st flagellomere 3.9-4.2 as long as deep at apex; mesoscutum with punctures, at least on basal 0.5, dense and separated by little more than their diameters; propodeal cristae not broadly projecting, rather inconspicuously subligu-

- late or subcuneate; sheathed portion of ovipositor 0.70–0.90 as long as fore wing; dorsal valve of ovipositor with a deep groove that reaches forward some distance from notch. . . . 6
6. Dorsal valve of ovipositor strongly rippled on tip, profile of dorsal valve between notch and apex slightly concave basad but becoming convex apicad; sheathed portion of ovipositor 0.80–0.90 as long as fore wing. 2. *T. carrascoi* Porter
- 6'. Dorsal valve of ovipositor smooth or slightly wrinkled on tip, profile of dorsal valve directly declivous between notch and apex; sheathed portion of ovipositor 0.70–0.80 (usually 0.70) as long as fore wing. 1. *T. metallicus* (Cameron)

MALES

(Male of *T. escomeli* lost)

1. Second gastric tergite uniformly mat and granular. 2
- 1'. Second gastric tergite smooth and polished, with more or less distinct micro-reticulation. 3
2. Mesoscutum with many, almost uniformly distributed, medium sized to large punctures; flagellum usually with a white band; hind tarsomeres 3–4 usually white; purple with blue or green gaster and no golden on thoracic pleura or propodeum. 9. *T. viridis* (Brullé)
- 2'. Mesoscutum with punctures usually dense only toward base of central lobe; no white on flagellum or on hind tarsus; purple or blue and purple with golden reflections on thoracic pleura or propodeum. 8. *T. cleonis* Viereck
3. Head very broadly white; gastric tergites 4–7 with broad white bands; apical margin of clypeus somewhat produced and feebly bilobed on median 0.5. 10. *T. venustus* Myers
- 3'. Head not or more narrowly marked with white; no white on gaster; apical margin of clypeus entire. 4
4. Temple with grossly tangled and shaggy setae; setae on 2nd gastric tergite well separated; propodeum short and high with apical face sharply discrete and vertically declivous; cristae narrowly ligulate; aggressively projecting; notauli reaching 0.7 length of mesoscutum; malar space 1.0 as long as basal width of mandible; mesosoma golden. 6. *T. imperator* Porter

- 4'. Temple with setae long but rarely tangled; many species with setae on 2nd gastric tergite long and much overlapping; propodeum more strongly sloping in profile, with apical face less sharply discrete than described above; cristae often conspicuous but not both narrow and greatly projecting; notauli 0.5 or less length of mesoscutum; malar space 0.7–1.0 as long as basal width of mandible; mesosoma purple or purple with a golden sheen 5
5. Mesoscutal punctures mostly separated by considerably more than their diameters, often sparse; propodeal cristae often quite large, bluntly cuneate and prominently projecting; apical trans-carina of propodeum often well developed throughout and narrowly looped forward medially 6
- 5'. Mesoscutum with punctures largely separated by little more than their diameters; propodeal cristae low to moderately projecting subligulate or subcuneate; apical trans-carina of propodeum largely or entirely absent 8
6. Setae on 2nd gastric tergite short, much less than the length of their interspaces; temple 1.0 as long as eye in dorsal view 3. *T. agalma* n. sp.
- 6'. Setae of 2nd gastric tergite long and considerably overlapping; temple 0.8–0.9 as long as eye in dorsal view 7
7. Flagellum black with reddish brown on segments 11–16; thorax and propodeum golden with purple reflections; temple with very long and shaggy setae; areolet exceptionally large, intercubiti parallel, 2nd intercubitus 0.7 as long as 1st intercubitus 5. *T. aglaus* Porter
- 7'. Flagellum with white on some of intermediate segments; thorax and propodeum mainly purple; temple with long but not shaggy setae; areolet large but not as asymmetric as described above, intercubiti quite strongly convergent dorsad 4. *T. aegla* n. sp.
8. White flagellar annulus on segments 11 or 12–16, 17, or 18; hind tarsomeres 3–4 white; malar space 0.6–0.8 as long as basal width of mandible; propodeal cristae low, weakly projecting, broadly subcuneate and extended a short distance anterio-mesad by a trace of the apical trans-carina 2. *T. carrascoi* Porter

- 8'. White flagellar annulus beginning on any segment from 2-11 and extending as far as 17 or 18; no white on hind tarsus; malar space 0.8-1.0 as long as basal width of mandible; propodeal cristae moderately projecting, subligulate or subcuneate, not prolonged antero-mesad
 1. *T. metallicus* (Cameron)

1. *Trachysphyrus metallicus* (Cameron)
 (Fig. 4, 5, 16).

Cyanocryptus metallicus Cameron, 1903. Entomologist 36: 122. Type ♂: Ecuador, Andes, outer slopes at 7-8000 ft (London).

Trachysphyrus phaedimus Porter, 1967. Mem. Amer. Ent. Inst. 10: 281-3. Type ♂: Chile, Tarapacá, Belén, Arica, 17-27-X-1952, L. E. Peña (Cambridge). NEW SYNONYMY

My first redescription of *T. metallicus* (Porter 1967: 277-79) was taken from 1 female and 2 males collected at Huárez and Matucana, Perú. Since then, 12 additional females and 23 more males have accrued, as a result of collecting at Matucana in Perú and in the Tarapacá Province of Chile. This material shows that *T. metallicus* demonstrates conspicuous variation (mainly chromatic) within each local population and also along a north to south cline. The southernmost populations in this cline (Tarapacá, Chile) originally were described as a separate species, *T. phaedimus* Porter (1967: 281-83), which now is synonymized with *T. metallicus*.

The following description redefines *T. metallicus* with special reference to its individual and polytypic variability.

FEMALE. *Color*: white flagellar band present on segments 2 or 3-8 or 9; with or without white line on hind orbit; metallic coloration of scape, head, mesosoma, coxae, trochanters, and gaster varying from deep blue with extensive purplish reflections to mostly bright purple with prominent to inconspicuous blue reflections; legs beyond trochanters varying from black with more or less subdued metallic reflections through mostly deep to bright orange (duller on tarsi).

Length of fore wing: 10.0-15.6 mm. *First flagellomere*: 3.9-4.4 as long as deep at apex. *Malar space*: 1.1-1.3 as long as basal width of mandible. *Temple*: 0.7-0.8 as long as eye in dorsal view; its punctures and setae conspicuous but variably dense. *Mesoscutum*: punctures, especially in Chilean specimens, often separated by as much

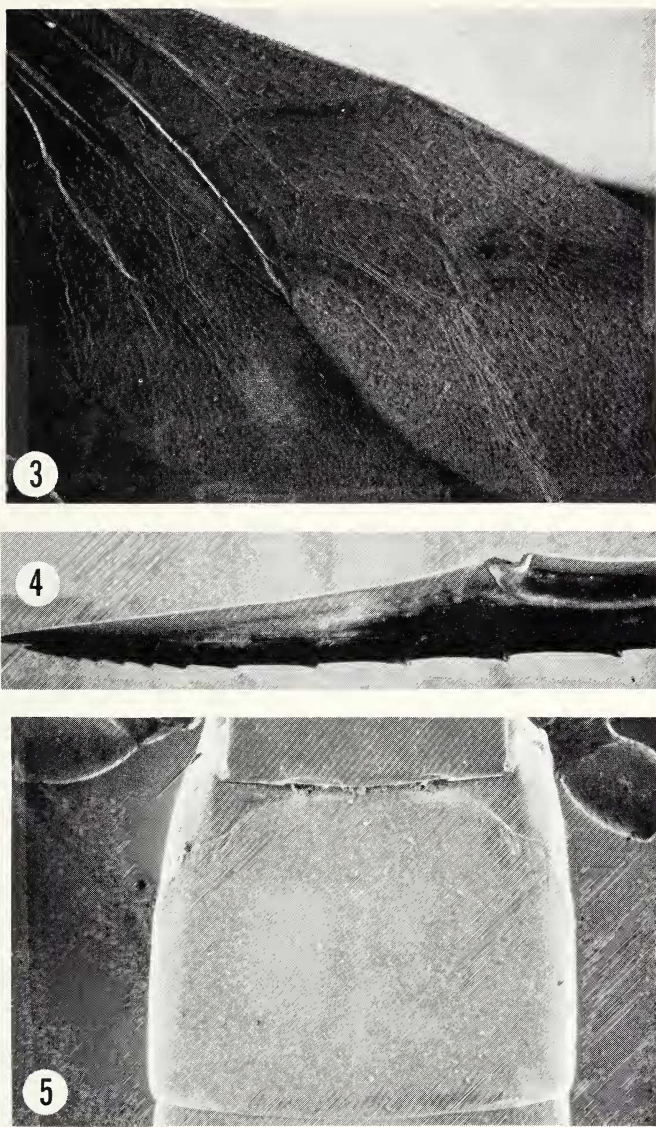


Fig. 3. *Trachysphyrus aegla*, ♂. Paratype. SEM photograph (30×), showing wing venation. Fig. 4. *Trachysphyrus metallicus*, ♀. SEM photograph (85×), showing ovipositor tip in lateral view. Fig. 5. *Trachysphyrus metallicus*, ♀. SEM photograph (25×), showing 2nd gastric tergite in dorsal view (setation very sparse).

as several times their diameter over apical 0.5 of mesoscutum. *Mesopleuron*: swollen area along prepectal carina above opposite speculum often largely smooth and polished with only sparse and tiny punctures. *Wing venation*: ramellus sometimes absent. *Propodeum*: basal and apical faces varying from weakly to (often) sharply discrete; cristae moderately small but well projecting, subligulate to bluntly cuneate. *First gastric tergite*: postpetiole 1.5–1.7 as wide apically as long from spiracle to apex; surface of postpetiole sometimes almost without micro-reticulation. *Second gastric tergite*: often highly polished and with faint to sometimes almost imperceptible micro-shagreening. *Ovipositor*: sheathed portion 0.7–0.8 as long as fore wing; tip 0.20–0.24 as high at notch as long from notch to apex.

MALE. *Color*: white flagellar annulus sometimes on as few as segments 11–17 or as many as 2–18, variable in all populations but averaging most extensive in Chilean specimens; hind orbit with or without a white line; legs beyond trochantelli often extensively orange.

Length of fore wing: 8.8–14.0 mm. *First flagellomere*: 2.6–3.5 as long as deep at apex. *Malar space*: 0.8–1.0 as long as basal width of mandible. *Temple*: 0.9–1.0 as long as eye in dorsal view. *Mesoscutum*: punctures average denser than in female. *Propodeum*: cristae subligulate to subcuneate and strongly projecting; apical transcarina scarcely palpable between cristae. *First gastric tergite*: 1.0–1.3 as wide apically as long from spiracle to apex. *Second gastric tergite*: micro-reticulation varying from faintly detectable to almost absent.

NEW SPECIMENS EXAMINED. 12♀ and 23♂: PERÚ, Lima Province, Matucana, 2389 m, 20–30-VI-1974, C. Porter, L. Stange, 27–30-VI-1976, C. Porter, C. Calmbacher, 15-VI-1979, C. Porter; CHILE, Tarapacá Province, Belén, 3170 m, 18–19-VII-1976, C. Porter, C. Calmbacher, H. Vargas; Chapiquiña, 3370 m, 17–20-VII-1976, C. Porter, C. Calmbacher, 3-VIII-1975, C. Porter, A. Matta; Putre, 3500 m, 8-VII-1977, C. Porter, G. Díaz; Socoroma, 3000 m, 7-VII-1977, Díaz, 19–24-VII-1977, C. Porter, G. Díaz, VII-1977, Malaise Trap, C. Porter, G. Díaz.

RELATIONSHIPS. *Trachysphyrus metallicus* and *T. carrascoi* occur sympatrically and seem to be very intimately related. They may be

distinguished in the female by differences of ovipositor tip shape and sculpture and in the male by less conspicuous and stable features of sculpture, proportion, and color.

VARIATION. North Chilean specimens of *T. metallicus* appear superficially very different from Peruvian material, because of their bright purple ground color, largely orange legs, and more extensive white flagellar annulus. Indeed, some individuals from Matucana, Perú have the ground color almost uniformly blue, the legs beyond the trochanters blackish with metallic reflections, and the flagellar annulus relatively brief. However, recent collecting at Matucana, Perú has shown that some specimens in that population have an extensive purple sheen overlaying the blue ground color, as well as largely orange femora and tibiae, and a comparatively broad flagellar annulus.

North Chilean populations of *T. metallicus* consequently represent one extreme in what appears to be a gradual cline and do not warrant formal recognition either at the subspecific or specific level.

FIELD NOTES. This species occasionally enters Malaise Traps (1 specimen from Socoroma, Chile), but is more often obtained by hand net on *Baccharis* or in alfalfa and oregano fields. Females consistently are swept from alfalfa patches. Possibly they parasitize some of the introduced noctuid pests, which attack this important forage crop that has been widely planted from the Puna to the coastal river valleys.

2. *Trachysphyrus carrascoi* Porter

(Fig. 12)

Trachysphyrus carrascoi Porter, 1967. Mem. Amer. Ent. Inst. 10: 279-81. Type ♀: Perú, Lima Province, Matucana, 28-V-1920, Cornell University Expedition (Ithaca).

I originally described this species from 2 females collected in Perú. At the same time I also mentioned, but excluded from the type series, 2 males from Putre in Tarapacá Province of north Chile (Porter 1967: 279-81). Recent fieldwork has added 6 females and 2 males of *T. carrascoi*. Study of this new material shows that the species does actually range from Matucana, Perú to north Chile but that the males which I originally associated with *T. carrascoi* probably belong to *T. metallicus*.

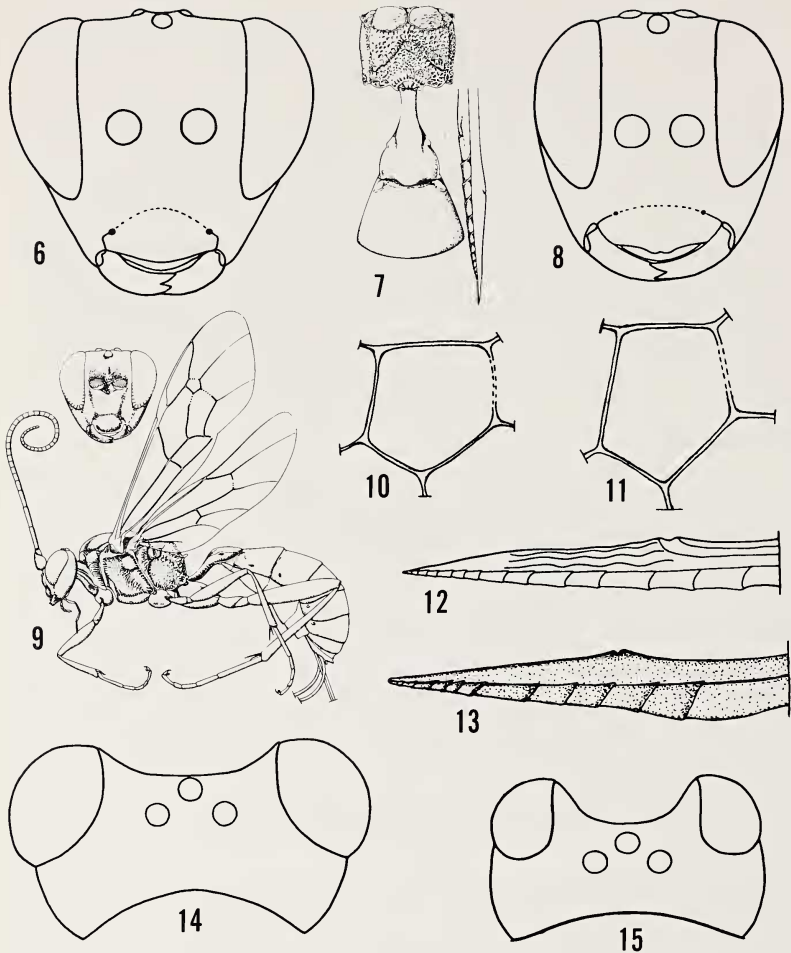


Fig. 6. *Trachysphyrus viridis*, ♀. Anterior view of head. Fig. 7. *Trachysphyrus cleonis*, ♀. Dorsal view of propodeum and first two gastric tergites, lateral view of ovipositor tip. (From Townes 1969: 432). Fig. 8. *Trachysphyrus venustus*, ♀. Anterior view of head, showing bisinuate apical margin of clypeus. Fig. 9. *Trachysphyrus cleonis*, ♀. Lateral view of entire insect, anterior view of head. (From Townes, 1969: 432). Fig. 10. *Trachysphyrus aglaus*, ♂. Holotype. Areolet. Fig. 11. *Trachysphyrus agalma* ♂. Paratype. Areolet. Fig. 12. *Trachysphyrus carrascoi*, ♀. Ovipositor tip in lateral view. Fig. 13. *Trachysphyrus agalma*, ♀. Holotype. Ovipositor tip in lateral view. Fig. 14. *Trachysphyrus viridis*, ♀. Head in dorsal view. Fig. 15. *Trachysphyrus venustus*, ♂. Head in dorsal view.

Below I give a revised description of *T. carrascoi*, including diagnosis of the previously unknown male.

FEMALE. *Color:* head, mesosoma and gaster metallic purple with more or less conspicuous blue reflections, gaster often almost wholly purple.

First flagellomere: 4.0–4.2 as long as deep at apex. *Clypeus:* almost flat, very low in profile, lower than in *T. metallicus*. *Mesopleuron:* swollen area above along prepectal carina opposite speculum sometimes much invaded by fine punctures and wrinkles; other wrinkling often extensively irregular. *First gastric tergite:* 1.4–1.7 as wide apically as long from spiracle to apex. *Second gastric tergite:* smooth and shining with micro-shagreening very weak to moderately well developed. *Ovipositor:* sheathed portion 0.8–0.9 as long as fore wing; dorsal valve on tip conspicuously rippled; profile of dorsal valve on tip a little concave over basal 0.5 but with a convex taper toward apex; tip 0.17–0.20 as high at notch as long from notch to apex.

MALE. *Color:* white flagellar annulus on segments 11 or 12 to 16, 17, or 18; head and mesosoma sometimes mostly metallic blue; fore and mid femora orange with purplish metallic staining below and anteriorly; hind femur completely orange; tibiae orange; hind tarsomeres 3 (except near base) and 4 white.

Length of fore wing: 9.6–11.3 mm. *First flagellomere:* 2.5–3.2 as long as deep at apex. *Malar space:* 0.6–0.8 as long as basal width of mandible. *Temple:* 0.9–1.1 as long as eye in dorsal view. *Mesoscutum:* punctures often dense throughout. *Propodeum:* cristae low and weakly projecting, broadly subcuneate; apical trans-carina detectable for a short distance antero-mesad of cristae. *First gastric tergite:* 1.1–1.3 as wide apically as long from spiracle to apex. *Second gastric tergite:* smooth and highly polished.

NEW SPECIMENS EXAMINED. 6♀ and 2♂: PERÚ, Lima Province, Matucana, 2389 m, 28-30-VI-1974, C. Porter, L. Stange, 4-5-VII-1976, C. Porter, C. Calmbacher; CHILE, Tarapacá Province, Chapiquiña, 3370 m, I-1977, Malaise Trap, C. Porter, G. Díaz.

RELATIONSHIPS. Females of *Trachysphyrus carrascoi* may be distinguished from all other Coastal Desert congeners because of the strongly rippled surface and concave-convex profile of the dorsal ovipositor valve between notch and apex. Otherwise, this species greatly resembles *T. metallicus* and often is hard to recognize from

males alone. Male *T. carrascoi* have some white on the hind tarsus (no white in *T. metallicus*) and, in comparison to *T. metallicus*, show lower and weaker propodeal cristae and a shorter malar space.

VARIATION. Some males of *T. carrascoi* have the mesoscutal punctation dense throughout but in others it becomes moderately sparse rearward. The less densely punctate specimens appear to be more common in north Chile, at the southern end of the species' range. As does *T. metallicus*, both sexes of *T. carrascoi* evidence a north-south cline (from blue to purple) in ground color.

FIELD NOTES. This species occurs in the same natural and cultivated high Andean habitats noted for *T. metallicus*. Like *T. metallicus*, it occasionally enters Malaise Traps.

3. *Trachysphyrus agalma* Porter, new species

(Fig. 11, 13)

FEMALE. *Color*: scape, pedicel, and (more dully) part of 1st and 2nd flagellar segments metallic purple; 1st flagellomere white above near apex, 2nd flagellomere white above almost throughout, 3rd flagellomere white with a little brownish below at base; flagellomeres 4-7 almost pure white; 8th flagellomere white above (more narrowly so apicad) and black below; rest of flagellum black; head and mesosoma metallic purple with some dark blue reflections; gaster dark metallic blue with conspicuous purple staining, especially toward base; coxae, trochanters, and trochantelli metallic purple; front femur dull orange with purplish near base and throughout posteriorly; mid femur metallic purple, grading into dull orange on apical 0.3 anteriorly; hind femur metallic purple with orange irregularly on apical 0.5; tibiae orange with some metallic reflections; tarsi mostly dusky to blackish, becoming dull orangish brown basad on 1st segments; wings moderately dark brown with blue reflections.

Length of fore wing: 8.8 mm. *First flagellomere*: 3.2 as long as deep at apex. *Clypeus*: low and gently convex in profile, with highest point near middle; apical margin straight. *Malar space*: 1.0 as long as basal width of mandible. *Temple*: 0.7 as long as eye in dorsal view; weakly and convexly receding. *Mesoscutum*: notauli sharp, not traceable much beyond basal 0.3 of mesoscutum; surface highly polished with numerous but mostly well separated, strong punctures; the punctures largest, densest and somewhat longitudinally slurred on central lobe, especially basad, but elsewhere contrastingly

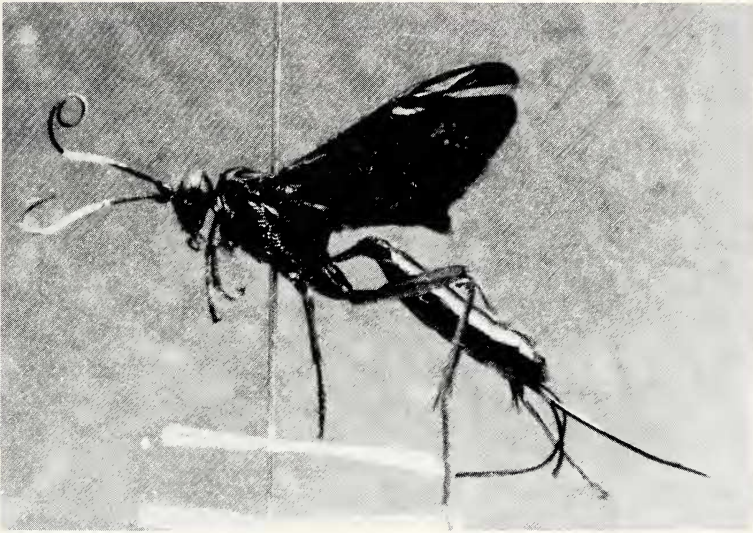


Fig. 16. *Trachysphyrus metallicus*, ♀. Photograph showing entire insect in lateral view.

smaller and sparser. *Mesopleuron*: speculum mostly polished and impunctate; the large antero-dorsal swelling along prepectus opposite speculum also polished, with small, sharp, scattered punctures; lower 0.5 of mesopleuron anteriorly likewise extensively polished and sparsely punctate; surface otherwise with gross but nearly parallel longitudinal wrinkles between speculum and anterior swelling, as well as with much gross wrinkling and foveolation in lower hind quadrant (where there are some intercalated smooth areas) and with strong wrinkles irregularly developed on peripheries of the smooth anterior-dorsal swelling. *Lower metapleuron*: with coarse and almost regular longitudinally oriented wrinkling. *Hind coxa*: dorsum polished and with small, sparse punctures. *Wing venation*: areolet unusually large and high with intercubiti weakly convergent above; 2nd abscissa of radius 0.8 as long as 1st intercubitus; apical abscissa of cubitus originating far dorsad, the 2nd intercubitus only 0.7 as long as ventro-posterior side of areolet; 2nd recurrent inserted a little before middle of areolet, almost straight and nearly vertical; disco-cubitus gently arched; ramellus absent; nervulus interstitial;

upper part of nervellus 1.3 as long as lower. *Propodeum*: moderately short and high, basal face arched and strongly sloping behind, the apical face discrete, nearly vertical, 0.8 as long as basal face; area basalis apically truncate; basal trans-carina moderately strong, highest medially, but comparatively inconspicuous (especially laterad) among the strong surface reticulations; apical trans-carina irregularly detectable, best represented by its large, projecting, broadly subligulate cristae; median longitudinal carinae inconspicuous and irregular, areola hexagonal and a little wider than long; lateral longitudinal carinae obsolete; surface with very coarse wrinkling that is strongest and transversely biased on apical face, grossly reticulate on basal face between the trans-carinae, and contrastingly finer basad of basal trans-carina. *First gastric tergite*: postpetiole 1.8 as wide at apex as long from spiracle to apex; dorsal carinae only faintly suggested in the supra-spiracular region, scarcely delimiting a median elevation; surface of postpetiole smooth and polished with scattered tiny punctures that become most numerous laterad. *Second gastric tergite*: thyridium much broader than long; surface smooth and polished with scarcely a trace of shagreening and with sparse but numerous tiny punctures that emit short, mostly well separated setae (which are densest laterad). *Ovipositor*: sheathed portion 0.56 as long as fore wing; gently upcurved; nodus comparatively prominent, with a conspicuous notch but without a fossa extending forward from the notch; dorsal valve profile strongly and directly tapering between notch and apex; tip 0.26 as high at notch as long from notch to apex.

MALE. Differs from female as follows: *Color*: flagellum black with white above on segments 7 or 8-9, almost wholly white on segments 10-15, and sometimes irregularly white on segment 16; head and mesosoma with a subdued golden sheen in addition to purple and blue reflections; a fine white line on much of hind orbit; femora bright orange; tibiae duller orange; fore tarsus blackish with dull orange, best developed toward base, on 1st segment; mid tarsus blackish, grading into dull orange basad on 1st segment; hind tarsus almost wholly black.

Length of fore wing: 8.0-12.0 mm. *First flagellomere*: 2.8 as long as deep apically. *Clypeus*: gently convex and a little bulging in profile; apical margin weakly convex. *Malar space*: 0.7-0.8 as long as basal width of mandible. *Temple*: 1.0 as long as eye in dorsal view;



Fig. 17. *Aeliopotes paitensis*, ♀. Photograph showing entire insect in lateral view.

gently receding and convex; surface with small, sharp, numerous punctures that are separated by more than $2\times$ their diameters and which emit long but not shaggy setae. *Mesoscutum*: notauli 0.3–0.5 as long as mesoscutum. *Lower metapleuron*: with coarse wrinkling which is more irregular and reticulate than in female. *Wing venation*; nervellus broken at middle. *Propodeum*: lower and longer than in female; apical face vertical but only 0.6 as long as basal face; basal trans-carina strong and sharp throughout; median longitudinal carinae faint; areola approximately 0.6 as wide as long; cristae bluntly cuneate, broad, rather strongly projecting. *First gastric tergite*: postpetiole 1.2–1.4 as wide apically as long from spiracle to apex; dorsal carinae traceable but not sharp on apex of petiole and basal 0.7 of postpetiole and there defining a broad but inconspicuous median elevation; setae on postpetiole largely shorter than the length of their interspaces. *Second gastric tergite*: thyridium ovoid; surface, much as in female, with minute punctures and short setae that become moderately dense only laterad.

TYPE MATERIAL. Holotype ♀: CHILE, Tarapacá Province, Socoroma, 3000 m, VII-1977, Malaise Trap, C. Porter, G. Díaz.

Paratype: 1 ♂, same data as holotype. Holotype in Florida State Collection of Arthropods. Paratype in Collection of Charles C. Porter.

RELATIONSHIPS. This species belongs to the *Imperialis* species group of *Trachysphyrus* (Porter 1967: 275-6). It shows superficial affinity to *T. escomeli* (Brèthes) and *T. aglaus* Porter.

Trachysphyrus escomeli (Porter 1967: 319-20) is known only from Arequipa on the west Andean slopes of southern Perú and might be expected to overlap the range of *T. agalma* in similar habitats of adjacent north Chile. Females of the 2 species differ because *T. agalma* has the clypeus low in profile (moderately high and bluntly subpyramidal in *T. escomeli*), the temple 0.7 as long as eye in dorsal view and sparsely punctate throughout (less than 0.5 as long as eye and becoming densely punctate above in *T. escomeli*), the notauli impressed for about 0.3 the length of the mesoscutum (0.7-0.8 the length of mesoscutum in *T. escomeli*), the mesopleuron with some areas of coarse wrinkling (with moderately strong reticulate wrinkling in *T. escomeli*), the 2nd gastric tergite scarcely shagreened (with fine micro-reticulation in *T. escomeli*), and the dorsal ovipositor valve tapering directly from notch to apex (a little convexly tapered in *T. escomeli*). Brèthes includes a male in his original diagnosis of *T. escomeli* (1919: 124), but that specimen now appears lost and the author's account of it does not allow comparison with males of related species.

Trachysphyrus aglaus (Porter 1967: 285-86) was described from a single male taken in the west Andean region of central Perú. This species resembles *T. agalma* in its peculiarly shaped areolet and rather strong propodeal cristae, but differs by its shaggy temporal setae, long and overlapping 2nd gastric setae, and shorter temples.

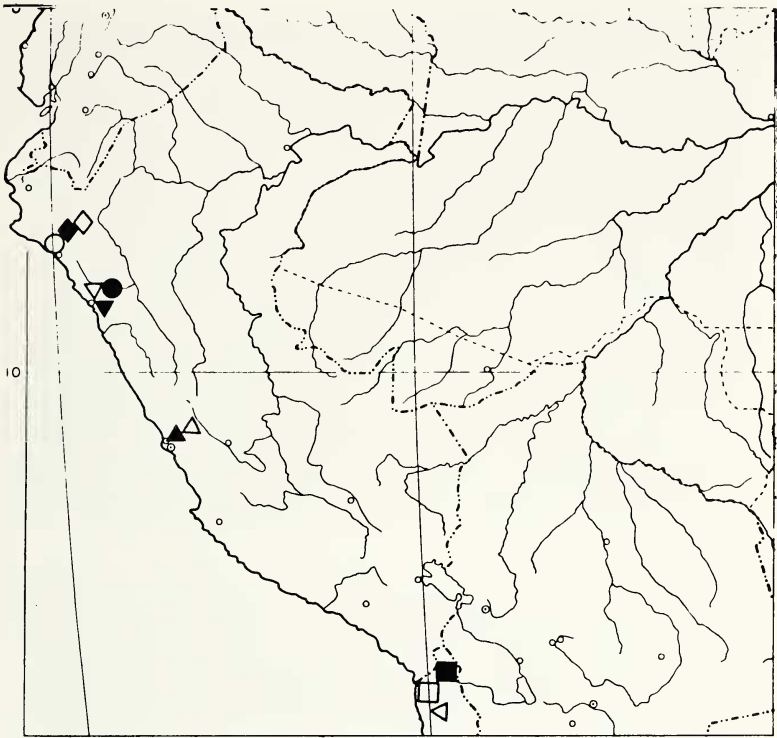
FIELD NOTES. Specimens of *T. agalma* were obtained only by Malaise Trap, although much hand collecting was done at the type locality. The trap was set up across an irrigation ditch bordered by tall bunch grass, oregano fields, and *Eucalyptus* trees.

SPECIFIC NAME. From the Greek noun *agalma*, "glory, honor, delight."

4. *Trachysphyrus aegla* Porter, new species (Fig. 1, 2, 3).

FEMALE. Unknown.

MALE. *Color*: scape and pedicel mostly metallic purple; flagel-



Peru and north Chile, showing localities where mesostenines were sampled during July 1974 and 1975.

- | | |
|---|--|
| 1. 33 kilometers west of Olmos, Peru. ◇ | 7. Matucana, Peru. △ |
| 2. Olmos, Peru. ◆ | 8. Cupiche, Sta. Eulalia, and Palle, Peru. ▲ |
| 3. Lambayeque, Peru. ○ | 9. Chapiquiña, Chile. ■ |
| 4. Samne, Peru. ● | 10. Valle de Lluta, Chile. □ |
| 5. Simbal, Peru. ▽ | 11. Codpa, Chile. ◊ |
| 6. Laredo, Peru. ▼ | |

Fig. 18. Map showing localities in Peruvian and north Chilean Coastal Desert and adjacent west Andean slopes where *Trachysphyrus*, *Aeliopotes*, and other mesostenines were collected in July of 1974 and 1975 (most sites were revisited in 1976, 1977, 1979, and 1982).

lum black and white (at least above) on segments 8, 9, or 10–13, 14, or 15; some specimens with a narrow white line on hind orbit; head, mesosoma, coxae, trochanters, fore and mid trochantelli, most of hind trochantellus, fore and mid femora on more than basal 0.5 (at

least below), and hind femur faintly (if at all) toward base, all metallic purple with sparse to extensive gold reflections; gaster metallic purple with blue reflections which become prominent beyond 2nd tergite; fore and mid femora orange toward apex or sometimes almost wholly orange above; hind femur mostly orange; tibiae orange; tarsi black with some brownish on 1st metatarsus; wings brownish with purple reflections.

Length of fore wing: 6.4–7.5 mm. *First flagellomere:* 2.6–3.0 as long as deep at apex. *Clypeus:* slightly to gently convex in profile; apical margin broad and gently convex. *Malar space:* 0.8–0.9 as long as basal width of mandible. *Temple:* 0.8–0.9 as long as eye in dorsal view; rounded and gently receding; highly polished with abundant but mostly well separated small, sharp punctures which emit long and, at least dorsad, well overlapping setae. *Mesoscutum:* notauli sharp, traceable about 0.5 the length of mesoscutum; surface highly polished with numerous small to large punctures that are separated mostly by much more than their diameters (the smooth interspaces prominent). *Mesopleuron:* speculum swollen and polished; surface otherwise polished and minutely punctate on much of upper anterior quadrant, on prepectus (sometimes much wrinkled), and on an extensive antero-ventral area behind prepectal carina, as well as often smooth for some distance below speculum, but otherwise with strong, longitudinally biased wrinkling between speculum and anterior swelling as well as on much of its lower hind quadrant. *Lower metapleuron:* with coarse reticulate wrinkling. *Wing venation:* areolet very large, intercubiti somewhat strongly convergent above, 2nd abscissa of radius 0.8–1.0 as long as 1st intercutitus; 2nd recurrent inserted near middle of areolet; disco-cubitus gently angled, with or without a stump of a ramellus; nervellus broken near middle. *Propodeum:* basal face long, steeply sloping; apical face obliquely reclivous and 0.5–0.6 as long as basal; basal trans-carina fine and sharp nearly throughout, a little weakened on lateral 0.4; apical trans-carina well defined, a little irregular to sharp throughout, narrowly looped far forward in middle, laterad forming moderately prominent and well projecting bluntly cuneate cristae; lateral longitudinal carinae obsolete; surface with strong reticulate wrinkling, the smooth interspaces between the wrinkles rather extensive, and the wrinkling becoming more or less weakened basad of basal trans-carina. *First gastric tergite:* postpetiole 0.9–1.4 as wide apically as long from spiracle to apex; dorsal carinae obsolete; surface

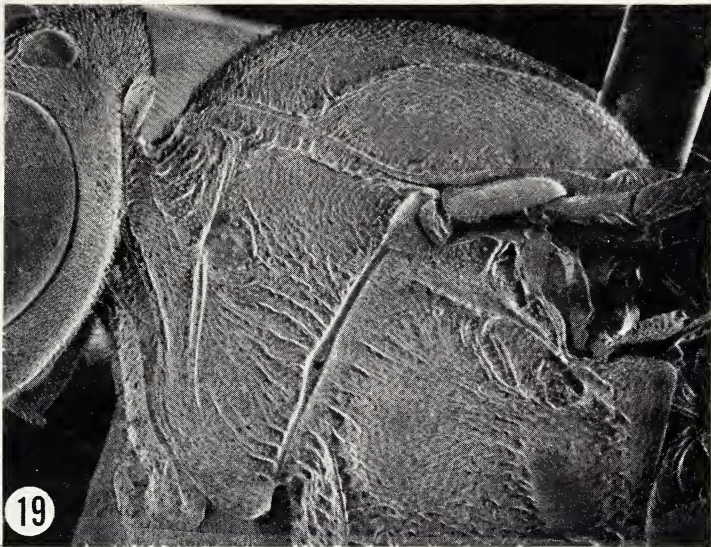


Fig. 19. *Aeliopotes paitensis*, ♀. SEM photograph (32X) of front part of thorax in lateral view (note dorsal contour of epomia). Fig. 20. *Aeliopotes paitensis*, ♀. SEM photograph (120X) showing prominent lateral teeth at base of 1st gastric tergite.

smooth and highly polished, scarcely shagreened, with scattered tiny punctures that emit long, mostly non-overlapping setae (which become longer and overlap apicad). *Second gastric tergite*: smooth and highly polished, sometimes with slight shagreening or micro-reticulation, and with numerous but remotely spaced tiny punctures that emit rather sparse setae which, nonetheless, mostly attain or a little surpass the length of their interspaces.

TYPE MATERIAL. Holotype ♂: CHILE, Tarapacá Province, Belén, 3170 m, 18-19-VII-1976, C. Porter, C. Calmbacher, H. Vargas. Paratypes: 3 ♂, 2 with same data as holotype, 1 ♂, CHILE, Tarapacá Province, Socoroma, 3000 m, 20-VI-1979, C. Porter. Holotype in Florida State Collection of Arthropods. Paratypes in Collection of Charles C. Porter.

RELATIONSHIPS. This high Andean species seems closely related to *Trachysphyrus agalma* Porter and *T. aglaus* Porter. It is best distinguished from the sympatric *T. agalma* by its sparse but very long and overlapping 2nd gastric setae (setae short and not overlapping in *T. agalma*). From the Peruvian *T. aglaus*, it differs in having the flagellum white banded, the temple conspicuously but not shaggily setose, and the areolet comparatively symmetric with dorsally convergent intercubiti.

FIELD NOTES. Specimens of *T. aegla* were obtained in the same type of West Andean Puna habitats already described for *T. carrascoi*, *T. metallicus*, and *T. agalma*.

SPECIFIC NAME. From the Greek noun *aegla*, "lustre, splendor, glory".

5. *Trachysphyrus aglaus* Porter (Fig. 10)

Trachysphyrus aglaus Porter, 1967. Mem. Amer. Ent. Inst. **10**: 285-7. Type ♂: Perú, Pachacayo, 28-III-1913, C. H. T. Townsend (Washington). No additional *T. aglaus* have accumulated since my original description.

This species inhabits the Andes of west-central Perú. Among congeners of the Coastal Desert and contiguous highlands, it most resembles *T. agalma* and *T. aegla*.

6. *Trachysphyrus imperator* Porter

Trachysphyrus imperator Porter, 1967. Mem. Amer. Ent. Inst. **10**: 301-2. Type ♂: Perú, Dept. La Libertad, "Jalca of Ramada", 21-VI-1964, R. M. Straw (Washington).

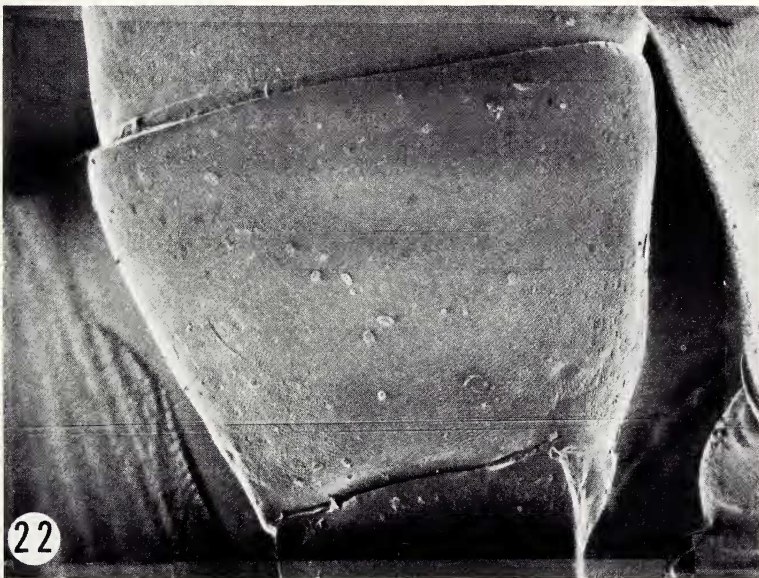
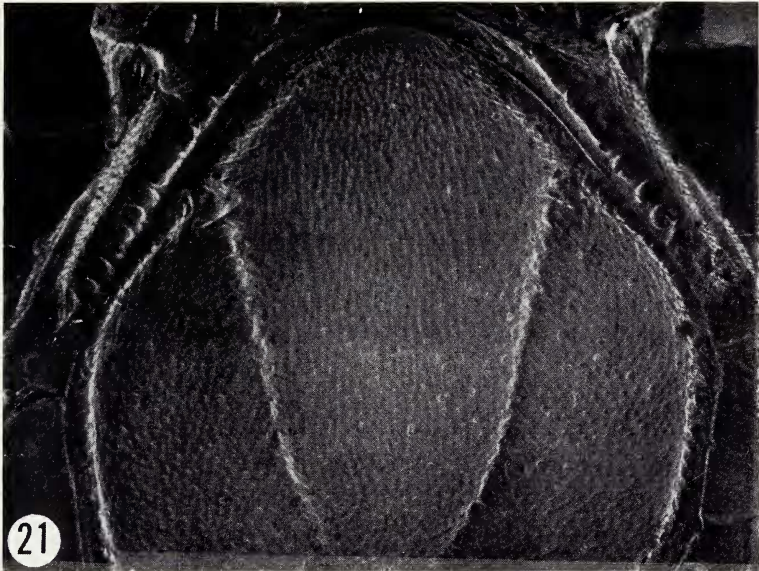


Fig. 21. *Aeliopotes paitensis*, ♀. SEM photograph (60X) of most of mesoscutum in dorsal view (note closed contour of epomia). Fig. 22. *Aeliopotes paitensis*, ♀. SEM photograph (25X) showing 2nd gastric tergite in dorsal view.

Trachysphyrus imperator remains known only from the holotype, obtained in the highlands of northwest Perú. Its closest relatives are *T. imperialis* and *T. peñai* from Neantarctic and Patagonian south Argentina and Chile.

7. *Trachysphyrus escomeli* (Brèthes)

Cryptus Escomeli Brèthes, (1918) 1919. Rev. Chilena Hist. Nat. 22: 124. Lectotype ♀ (labeled by Porter): Perú, Arequipa (Buenos Aires).

The only known specimen of *T. escomeli* is the lectotype, which I examined in December 1964 at the Museo Nacional in Buenos Aires, Argentina.

Arequipa, the Peruvian type locality for this species, is situated in a vast fertile valley of the Coastal Desert at 2800 m altitude near the main Andean cordillera. Repeated fieldwork from 1975–1982 in nearby north Chile and at Arequipa itself has failed to discover additional specimens of *T. escomeli*.

As previously mentioned, this species shares some features with *T. agalma* Porter and *T. aglaus* Porter but does not seem closely related to any other *Trachysphyrus*.

8. *Trachysphyrus cleonis* Viereck (Fig. 7, 9)

Trachysphyrus cleonis Viereck, 1913. Proc. U.S. Natl. Mus. 44: 470. Type ♀: Perú, Cuzco, 11,500 ft (Washington).

My redescription of *T. cleonis* (Porter 1967: 312–14) was based on 70 females and 69 males from the central and western Andes of southern Perú. Most of this material came from Cuzco and other high inland localities, but several specimens were reported from Oroya, Acolla, and Jauja at elevations approaching 4000 m just above the Coastal Desert on the west Andean slopes.

Western populations of *T. cleonis* have the body metallic blue and the legs blackish. Central Peruvian specimens are purple with orange legs. Such geographic variation suggests past or present discontinuities in the species' distribution, as perhaps determined by Pleistocene to recent climatic instability.

Most of my records for *T. cleonis* span the spring and summer months (September to March). I have not collected the species during June and July fieldwork in Perú between 1974 and 1982. Long-term phenologic analysis probably will confirm that other sympatric

Trachysphyrus show different but equally consistent patterns of seasonal occurrence.

In this species and the closely related *T. viridis* (Brullé) the second gastric tergite is mat and delicately granular. In all other Coastal Desert *Imperialis* Group *Trachysphyrus* the gastric terga are smooth and polished. *Trachysphyrus cleonis* differs from *T. viridis* by its sparsely punctate mesopleuron, wholly dark flagellum, and gold-stained thoracic pleura and propodeum.

9. *Trachysphyrus viridis* (Brullé)

(Fig. 6, 14).

Joppa viridis Brullé, 1846. In Lepeletier: Histoire naturelle des insectes. Hyménoptères 4: 286. Type ♂: Argentina, Buenos Aires (Turin).

Cryptus Kinbergi Holmgren, 1868. Kongliga svenska fregatten Eugénies resa. . 2(1): 397. Lectotype ♀ (labeled by Townes): Argentina, Buenos Aires (Stockholm).

This *Trachysphyrus* long has been known as *T. kinbergi* (Holmgren). However, recent examination of Brullé's holotype confirms that *viridis* is the senior available name for the species (Porter 1975: 169).

The only Coastal Desert record for *T. viridis* is of a single female taken at Arequipa, Perú (Porter 1967: 308). Otherwise, *T. viridis* ranges over most of southern South America from Lake Titicaca to the Strait of Magellan, but avoids Chile except at a few localities in the south where Patagonian Desert habitats intrude westward from Argentina. The species prefers semiarid to arid localities between sealevel and 3000 m, being especially characteristic of the Argentine Prepuna, Subandean Desert, Sierras de Córdoba, Chaco, Pampa, and Patagonian Desert.

In accordance with its wide altitudinal and latitudinal range, *T. viridis* varies strikingly in phaenology from population to population. In the south or at high altitudes (1–3000 m), it generally is active during the warmer months of November to April. In the scorchingly subtropical Chaco Thorn Scrub (e.g., at Las Termas De Río Hondo in Santiago del Estero, Argentina), adults emerge mainly during the mild weather of late May to early August.

10. *Trachysphyrus venustus* Myers

(Fig. 8, 15).

Trachysphyrus venustus Myers, 1914. Proc. U.S. Natl. Mus. 45: 361. Type ♂: Perú, Coropuna at 14,500 ft (Washington).

This is the only *Imperialis* Group *Trachysphyrus* with an apically bisinuate clypeus, mostly white head, and broadly white marked gaster. It occurs in high Andean habitats (Puna and Altiplano) near the snowline and ranges from north Chile through adjoining Perú and south Bolivia to Catamarca Province of northwest Argentina. It flies during the warmest months of the year (late October to January) and even then endures temperatures of at most 8–15°C by day and hard frosts every night.

NEW SPECIMENS EXAMINED. 1 ♀: CHILE, Tarapacá Province, Putre, 3400 m, "Nov.". This specimen is in the collection of the Centro de Investigación y Capacitación Agrícola (C.I.C.A.) of the Universidad del Norte at Arica, Chile.

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The Scanning Electron Microscope photographs were taken by Mr. Jaime Zung of Fordham University, using a Hitachi S-510 under the supervision of Dr. E. Ruth Witkus.

SUMMARY

The mesostenine genus *Trachysphyrus* occurs from Ecuador to Tierra del Fuego in Andean, temperate, subtropical, and Neantarctic Biomes. It has 7 endemic species in the Coastal Desert, of which *T. aegla* and *T. agalma* are new. *Trachysphyrus* has produced a specialized offshoot in the Coastal Desert (*Amblyteles paitensis* Cockerell). This species now is placed in the new genus *Aeliopotes*.

Trachysphyrus may be recognized by its dark and refulgent wings; lack of white marks on the mesosoma; metallic (blue, green, purple, gold) ground color; strong and usually elongate notauli; shining mesoscutum; at most weakly angled discocubitus; straight mediella; axillus intermediate between anal margin of wing and submediella; long propodeal spiracle; at most finely punctate 2nd gastric tergite; and long, stout, moderately compressed, straight or a little upcurved ovipositor. *Aeliopotes* differs from *Trachysphyrus* especially by its black and red ground color; dorsally lamellate epomia; and baso-laterally toothed 1st gastric tergite.

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